**Helpful Tips and Information for Completing Part 2 (Paragraphs 3 and 4) of the AP Biology Final Exam**

Mrs. Krouse, AP Biology

**Paragraph 3:** Parent Generation Plants

1. Describe the difference between the stem colors of the P1 and P2 plants. Include photographs to support your description.

If you were here in class on Tuesday, April 12th (for 1st period) and Wednesday, April 13th (for 5th and 7th period), we took pictures of our P1 and P2 plants with our phones. We made sure to indicate to ourselves which type of plant (P1 or P2) was shown in each picture. If you were not here when we took pictures, you can use pictures from a classmate. When you include your photographs in your report, please include titles like “Stem Color of the P1 Plants.” If your picture shows the entire plant (not just the stem), use an arrow to point to the stem in the image.

1. Describe the difference between the leaf colors of the P1 and P2 plants. Include photographs to support your description.

Same tips as those given for Part A.

**Paragraph 3:** F1 Generation Plants

1. Identify the stem and leaf colors of your F1 plants.

Here is the data that we collected for stem / leaf colors among the P1, P2, and F1 plants. This is the data for all my classes.

***Table 1. Class Data of Phenotype Numbers*** *(Record the number of each plant type)*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Purple Stem/Green Leaf Phenotype | Non-purple Stem/Green Leaf Phenotype | Purple Stem/Yellow-Green Leaf Phenotype | Non-purple Stem/Yellow-Green Leaf Phenotype | Total # of plants |
| Parent 1 | 19 |  |  |  | 19 |
| Parent 2 |  |  |  | 21 | 21 |
| F1 | 99 |  |  |  | 99 |

1. State which stem color is dominant and which is recessive. Include a monohybrid Punnett square and text explanation to justify this statement. To create a Punnett square, you will need to assign each stem color a dominant allele (“A”) or recessive allele (“a”). Keep in mind that both parents are purebred for the trait of stem color (i.e., one parent is homozygous dominant and the other is homozygous recessive).

Make sure to answer the following questions to receive full credit…

1. Which stem color (purple or non-purple) is dominant and which is recessive based on your P1, P2, and F1 phenotypes? Explain your answer.
2. Which allele (purple or non-purple) will be assigned the letter “A” and why?
3. Which allele (purple or non-purple) will be assigned the letter “a” and why?
4. What are the genotypes of your P1 and P2 plants, and how did you identify these genotypes?
5. How did you set up your Punnett square to show the passage of stem color from the P1 and P2 plants to the F1 offspring?
6. What are the genotypes and phenotypes of the F1 offspring according to your Punnett square?

Remember, you must type your paragraphs, but you can include your Punnett square in the margin.

1. State which leaf color is dominant and which is recessive. Include a monohybrid Punnett square and text explanation to justify this statement. To create a Punnett square, you will need to assign each leaf color a dominant allele (“B”) or recessive allele (“b”). Keep in mind that both parents are purebred for the trait of leaf color (i.e., one parent is homozygous dominant and the other is homozygous recessive).

Make sure to answer the following questions to receive full credit…

1. Which leaf color (green or yellow-green) is dominant and which is recessive based on your P1, P2, and F1 phenotypes? Explain your answer.
2. Which allele (green or yellow-green) will be assigned the letter “B” and why?
3. Which allele (green or yellow-green) will be assigned the letter “b” and why?
4. What are the genotypes of your P1 and P2 plants, and how did you identify these genotypes?
5. How did you set up your Punnett square to show the passage of leaf color from the P1 and P2 plants to the F1 offspring?
6. What are the genotypes and phenotypes of the F1 offspring according to your Punnett square?

Remember, you must type your paragraphs, but you can include your Punnett square in the margin.

1. Identify the genotype (e.g., AABB) of your F1 plants.

Here you just have to write one sentence in which you identify the overall genotype (i.e. the alleles that code for both stem color and leaf color) in the F1 plants. You should be able to determine this genotype based on your answers to Part C and Part D.

1. Provide a dihybrid Punnett square to show the passage of BOTH stem color and leaf color from the parent generation to the F1 generation.

To get the point for this part of Paragraph 3, you need to show the correct dihybrid Punnett square. There is only one correct answer.

To re-learn how to set-up and complete a dihybrid Punnett square, refer to the Unit 10, Notes Packet 1 (The Basics of Mendelian Genetics)